

Remarks:

Claims 2-28 and 30-71 remain for consideration in this application. Claims 2, 5, 8, 9, 11-12, 24, 27, 30, 33-34, 36, 46, and 51 have been amended, and claims 1 and 29 have been canceled. Claims 64-71 are newly added. Support for the recitation of "from about 0.02-5% by weight of a weak acid" can be found on page 4, line 11 of the specification. Also, a minor amendment has been made to the specification to correct a typographical error. A marked-up version of the changes made is attached hereto.

Turning now to the office action, the Examiner rejected claims 12-23 and 27 under 35 U.S.C. § 112. Claims 12 and 27 have been amended to overcome this rejection.

The prior art rejections raised by the Examiner can be summarized as follows:

- (1) claims 1-3, 5-10, 12-14, 16-21, 23, 24, 26-31, 33-35, 37-39, 41-43, 45-46, and 48-63 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,919,599 to Meador et al. (hereinafter "the Meador et al. patent");
- (2) claims 11, 22, 25, 36, 44, and 47 have been rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over the Meador et al. patent;
- (3) claims 1-4, 12-15, 29-32, 37-40, and 45 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,207,787 to Fahey et al. (hereinafter "the Fahey et al. patent"); and

(4) claims 4, 15, 32, and 40 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the Meador et al. patent in view of the Fahey et al. patent.

Claims 11, 12, 24, 36, 37, 46, 51, 56, 60, 64, 66, and 68 are in independent format. The only prior art rejection raised against claims 11 and 36 (which have now been rewritten in independent format) was that set forth under paragraph (2) above. The Examiner asserted that the spin bowl compatibility test result recited by the pending claims is inherently disclosed by the Meador et al. patent or would have at least been obvious to achieve. However, the applicants respectfully disagree with this rejection and in support of this position are submitting herewith a declaration by Xie Shao, one of the inventors named in the present application. In this declaration, Ms. Shao describes how Example 1 of the Meador et al. patent was duplicated, and the spin bowl compatibility (using various solvents) was determined. None of these determinations gave a spin bowl compatibility test result of at least about 90% as recited by the pending claims. Thus, any rejection to these claims (and to claim 51 which includes the limitations of claim 11) under § 102(b) in light of the Meador et al. patent should be withdrawn.

Furthermore, it is respectfully submitted that any rejection to claims 11, 36, and 51 as being obvious in light of the Meador et al. patent should also be withdrawn. There is no teaching or suggestion in the Meador et al. patent, either alone or in combination with the art of record, of modifying the Meador et al. patent in such a manner to achieve a spin bowl compatibility of at least about 90%. This limitation represents a significant improvement over the art in that the blocking of drain pipes and buildup in spin bowls is inhibited or avoided entirely. Thus, it is believed that this

rejection should be withdrawn. Furthermore, dependent claims 22, 25, 44, 47, 65, and 67 are patentable for the same reasons.

Independent claims 12, 37, and 56 each recite that the weight ratio of strong acid to weak acid is from about 0:100 to about 50:50. The Examiner rejected these claims as being anticipated by either Fahey et al. or Meador et al. (set forth in paragraphs (1) and (3) above). However, the applicants respectfully submit that these rejections are inappropriate. The recited range of strong acid to weak acid of from about 0:100 to about 50:50 *requires* the presence of a weak acid. If the ratio of strong acid to weak acid is 0:100, then all of the acid present in the composition is a weak acid. At the other extreme of this range, if the ratio of strong acid to weak acid is 50:50, then one half of the acid present in the composition is a weak acid. Regardless of which end of the range is considered (as well as all points between), this claim always requires the presence of a weak acid in the anti-reflective composition. This is not taught or suggested by either the Meador et al. or the Fahey et al. patents. The Meador et al. patent does not teach or suggest the use of any weak acid. Rather, the Meador et al. patent only teaches the use of strong acids as noted by the Examiner.

Furthermore, the Fahey et al. patent does not teach or suggest the use of any acid whatsoever in an anti-reflective composition. The only acid disclosed by Fahey et al. is found in column 5, lines 3-15 where an acid is used to terminate a polymerization reaction. However, this teaching refers purely to the use of an acid to prepare a polymer which is subsequently used as an ingredient to prepare an anti-reflective composition. There is no teaching of using an acid (weak or otherwise) in *an anti-reflective composition*. This is further confirmed by the teachings of Fahey et al. in column 5, lines 39-61 wherein Fahey et al. describe an exemplary anti-reflective composition.

Clearly, no acid is added to this composition. Thus, it is submitted that the rejections to these claims should be withdrawn.

The Examiner rejected claims 24, 46, and 60 as being anticipated by the Meador et al. patent (see paragraph (1) above). The Examiner indicated that the Meador et al. patent taught the use of phosphoric acid. As a result, the applicants have canceled the recitation of phosphoric acid so these claims are no longer anticipated by Meador et al. Furthermore, it is submitted that claims 24, 46, and 60 are not obvious in view of Meador et al. because there is no teaching or suggestion in Meador et al. of including bisphenol A or  $\alpha$ -cyano-4-hydroxycinnamic acid in an anti-reflective composition.

The remaining independent claims for which patentability has not been argued above are newly added claims 64, 66, and 68. Each of these claims recites a composition which comprises less than about 0.3% by weight of a strong acid *and* from about 0.02-5% by weight of a weak acid. These claims are patentable over the Fahey et al. and Meador et al. patents for the same reasons discussed above with respect to claims 12, 37, and 56. That is, each of these claims requires the presence of a weak acid, and neither of these two patents teaches or suggests the use of a weak acid (and Fahey et al. lacks the teaching of a strong acid as well). Thus, it is believed that these claims are patentable over the art as well.

In view of the foregoing, a Notice of Allowance appears to be in order and such is respectfully requested. Any additional fee which is due in connection with this amendment should be applied against Deposit Account No. 19-0522.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Specification:

The paragraph beginning at line 19 of page 3 has been amended as follows:

In one embodiment, the compositions comprise less than about 1.0% by weight of a strong acid, preferably less than about 0.3% by weight of a strong acid, more preferably less than about 0.1% by weight of a strong acid, and even more preferably about 0% by weight of a strong acid, based upon the total weight of the composition taken as 100% by weight. In this embodiment, it is particularly preferred that the polymer utilized ~~having~~ has a high weight average molecular weight (e.g., at least about 60,000). As used herein, the term "strong acid" is intended to refer to those compounds having a  $pK_a$  of less than about -6.0 at 25°C. Examples of strong acids include *p*-toluenesulfonic acid, sulfuric acid, hydrochloric acid, hydrobromic acid, nitric acid, trifluoroacetic acid, and perchloric acid.

Claims:

The claims have been amended as follows:

Claims 1 and 29 have been canceled.

2. (Amended) The composition of claim 11, said composition further comprising a compound selected from the group consisting of phenolic compounds, carboxylic acids, phosphoric acid, and cyano compounds.

5. (Amended) The composition of claim 11, wherein said composition comprises a compound selected from the group consisting of surfactants, crosslinking agents, and mixtures thereof.

8. (Amended) The composition of claim 11, wherein said solvent system includes a solvent selected from the group consisting of PGMEA, PGME, propylene glycol *n*-propyl ether, 2-heptanone, *N*-methylpyrrolidinone, ethyl lactate, cyclohexanone, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether, and mixtures thereof.

9. (Amended) The composition of claim 11, wherein said polymer is selected from the group consisting of acrylic polymers, polyesters, epoxy novolaks, polysaccharides, polyethers, polyimides, and mixtures thereof.

11. (Amended) ~~The composition of claim 1, wherein said composition In an anti-reflective coating composition for use during microlithographic processes, said composition comprising a polymer dissolved in a solvent system, the improvement being that said composition comprises less than about 0.3% by weight of a strong acid and gives a spin bowl compatibility test result of greater than about 90%.~~

12. (Amended) In an anti-reflective coating composition for use during microlithographic processes, said composition comprising a polymer dissolved in a solvent system and having a weight ratio of strong acid to weak acid, the improvement being that the weight ratio ~~of strong acid to weak acid in said composition~~ is from about 0:100 to about 50:50.

24. (Amended) In an anti-reflective coating composition for use during microlithographic processes, said composition comprising a polymer dissolved in a solvent system, the improvement being that said composition comprises a compound selected from the group consisting of Bisphenol A, ~~phosphoric acid~~, and  $\alpha$ -cyano-4-hydroxycinnamic acid.

27. (Amended) The composition of claim 24, said composition having a weight ratio of strong acid to weak acid, wherein the weight ratio of strong acid to weak acid in said composition is from about 0:100 to about 50:50.

30. (Amended) The combination of claim ~~29~~ 36, said composition further comprising a compound selected from the group consisting of phenolic compounds, carboxylic acids, phosphoric acid, and cyano compounds.

33. (Amended) The combination of claim ~~29~~ 36, wherein said composition comprises a compound selected from the group consisting of surfactants, crosslinking agents, and mixtures thereof.

34. (Amended) The combination of claim ~~29~~ 36, wherein said polymer is selected from the group consisting of acrylic polymers, polyesters, epoxy novolaks, polysaccharides, polyethers, polyimides, and mixtures thereof.

36. (Amended) ~~The combination of claim 29, wherein~~ The combination of a substrate having a surface and a cured protective layer on said substrate surface, said cured protective layer being formed from a composition comprising a polymer dissolved in a solvent system and less than about 0.3% by weight of a strong acid, said composition giving ~~gives~~ a spin bowl compatibility test result of greater than about 90%.

46. (Amended) The combination of a substrate having a surface and a cured protective layer on said substrate surface, said cured protective layer being formed from a composition comprising a polymer dissolved in a solvent system and a compound selected from the group consisting of Bisphenol A, ~~phosphoric acid~~, and  $\alpha$ -cyano-4-hydroxycinnamic acid.

51. (Amended) A method of forming a precursor structure for use in manufacturing integrated circuits, said method comprising the step of applying a quantity of an anti-reflective composition according to claim 11 to the surface of a substrate to form an anti-reflective layer on said substrate surface.

Claims 64-71 have been added.